

MISTI Shielding and Dosimetry Experiment, Phase I

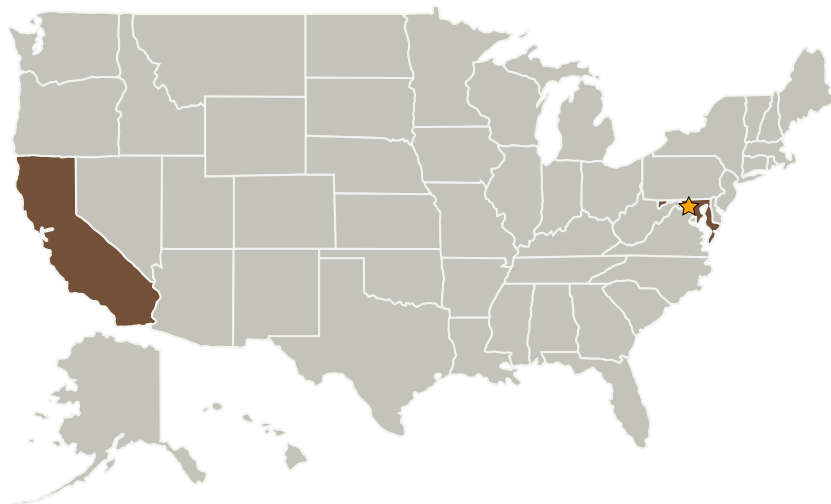
Completed Technology Project (2006 - 2006)



Project Introduction

Reliable on-orbit dosimetry is necessary for understanding effects of space radiation environments on spacecraft microelectronics performance and comparison of on-orbit results to ground-based testing and modeling. Understanding dosimetry at the micro-level is becoming increasingly necessary as microelectronic devices become more complex. Several innovative dosimetry approaches are under development by various groups to meet these needs. Spot shielding is commonly used to increase survivability of unhardened microelectronics in spacecraft design. The efficacy of spot shielding to reduce the TID effects has recently come into question, with spot shielded FPGA devices degrading faster than unshielded devices on an MPTB space experiment. A study is underway to understand this anomalous result and one product of the study will be a prototype space experiment board focused on testing spot shielding. Both the dosimetry issue and the spot shielding issue are critical to use of COTS microelectronics in space system design. We propose to combine the spot shielding experiment with emerging dosimetry approaches and develop hardware and software for a space experiment that provides real-time dosimetry from multiple dosimetry types. The experiment will be designed using an innovative low power experiment card with plans for integration on the Space Environment Testbed (SET) Carrier.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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| Organizations Performing Work | Role | Type | Location |
|------------------------------------|-------------------------|-------------|-----------------------|
| ★Goddard Space Flight Center(GSFC) | Lead Organization | NASA Center | Greenbelt, Maryland |
| PR&T, Inc. | Supporting Organization | Industry | Fallbrook, California |

Primary U.S. Work Locations

| | |
|------------|----------|
| California | Maryland |
|------------|----------|

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - └ TX06.5 Radiation
 - └ TX06.5.3 Protection Systems